Claims

1. A viscosimter for measuring the relative, intrinsic or inherent viscosity of a solution (13) in a solvent (12) with at least one flow resistance (15, 16; 27 to 30) and one feeding point (20, 21; 36; 38) for the solution to be examined (13) in a conduit system (14, 22; 24 to 26, 31) as well as with respective manometers (17, 18; 33) on the flow resistance (15, 16; 27 to 30) which are coupled with a differential amplifier (19),
characterized in
that the viscosimeter (40) shows flow resistances (15, 15; 27) such as disk-shaped or leaf-shaped Venturi nozzles or different KV flow resistances with the smallest possible thickness and with a small volume with respect to all other parallel and following capillaries in a flow conduit system with two legs (L1, L2) which contains in the first leg (L1) at least three pressure reducing elements, for example capillaries, whereby behind the capillary (103) following the branch point (102) a pressure manometer (104) is provided for with a connected bigger vessel (105), whereby behind further capillaries (106, 108) connected with each other with different diameters and with a big volume which corresponds to 100 to 1000 times the KV flow resistance (221) in the second leg (L2), a branch point (109) leads to a differential pressure sensor or a sensor for differential pressure (122) followed by capillaries (110, 112) with different diameters connected with each other (111) up to the junction (113) in a common outlet conduit (114), whereby in the second leg (L2) the KV flow resistance (221) follows the branch point (102), this resistance being followed by further big volume conduits which lead to the branch point (118) of the opposing side of the differential pressure sensor or of the sensor for differential pressure (122), whereby further capillaries (115, 117) with different diameters and with different lengths connected with

each other (116) follow the branch point (118), these capillaries joining into the common outlet conduit (114).

2. A viscosimeter according to claim 1,
characterized in
that the viscosimeter comprises an inlet (101) which runs into a junction (102) from which the one capillary (103) in one first leg (L1) leads over a big distance and with a comparatively big volume to a manometer (absolute pressure manometer) (104) and from this to a still bigger vessel (105) which has a 100 times to 1000 times bigger volume than the volume of the KV flow resistance (121) in the second leg (L2), a connecting conduit leading from the vessel (105) to a pressure reducing element (106) which is a capillary, a nozzle, a frit or an appropriate supplying conduit which reduces the pressure in the flow conduit, that the pressure reducing element (106) is connected over a connection (107) with a further capillary (108) with a big volume which runs into the branch point (109), whereby the differential manometer or the sensor for differential pressure (122) placed in the connecting conduit between the two branch points (109, 118) in both legs (L1, L2) measures high sensitively the slightest pressure differences between the two branch points (109, 118) of the flow conduit, that the big volume capillary (110) following the connecting point (109) leads over a connection (111) to a pressure reducing capillary (112), whereby the pressure reduction must not be identical with that in the upper section of the flow conduit, that a connecting conduit follows the capillary (112) into the junction (113) of both legs (L1, L2) to a common outlet conduit (114) which makes possible the common discharge of the solvents from different flow lines, that from the branch (102) in the second leg (L2), a pressure reducing element (121) which can have different configurations leads directly into a big volume

vessel (120) and from there into a conduit (119) with a big internal diameter which is connected by the branch (118) with the differential manometer or differential pressure sensor (122), whereby the differential pressure sensor (122) is switched here in such a way that it generates a positive signal for a pressure drop at the branch point (118) and that a conduit (117) with a big internal diameter follows the branch point (118), this conduit being connected over the connection (116) with a pressure reducing capillary (115) and constituting the access to the junction (113) and to the outlet conduit (114).

3. A viscosimeter for measuring the relative, intrinsic or inherent viscosity of a solution (13) in a solvent (12) with at least one flow resistance (15, 16; 27 to 30) and one feeding point (20, 21; 36; 38) for the solution to be examined (13) in a conduit system (14, 22; 24 to 26, 31) as well as with respective manometers (17, 18; 33) on the flow resistance (15, 16; 27 to 30) which are coupled with a differential amplifier (19),
characterized in
that the viscosimeter (40) shows flow resistances (15, 15; 27 to 30) such as disk-shaped or leaf-shaped Venturi nozzles or different KV flow resistances with the smallest possible thickness and with a small volume with respect to all other parallel and following capillaries in a flow conduit system with two legs (L1, L2) which shows three parallel flow circuits among which at least two flow circuits are connected by a differential pressure sensor or a sensor for differential pressure (216), whereby the three flow circuits constitute an analogy to the Thomson bridge, whereby the arrangement consists of an inlet (201) which runs into a branch (202) and divides into two legs (L1, L2), whereby the first leg (L1) comprises a pressure reducing element (203), a following branch point (204) to a differential pressure sensor or to a sensor for differential

pressure (216) and a pressure reducing element (205) in the feeding conduit to a junction (206) which runs into an outlet conduit (207) and that the second leg (L2) starting from the branch point (202) comprises a pressure reducing element (212) which leads to a branch (211) which first leads into a big volume vessel (210) leading to a junction (209) and second which leads to a resistance capillary (213) which is connected in the junction (215) with the differential pressure sensor or the sensor for differential pressure (216) and which is furthermore connected with a resistance capillary (214) in the conduit led from the junction (215) to a further junction (209), whereby the resistance capillary (214) is connected on the outlet side over the junction (209) with a pressure reducing element (208) which runs over a conduit section into the junction (206) and thus into the outlet conduit (207).

4. A viscosimeter for measuring the relative, intrinsic or inherent viscosity of a solution (13) in a solvent (12) with at least one flow resistance (15, 16; 27 to 30) and one feeding point (20, 21; 36; 38) for the solution to be examined (13) in a conduit system (14, 22; 24 to 26, 31) as well as with respective manometers (17, 18; 33) on the flow resistance (15, 16; 27 to 30) which are coupled with a differential amplifier (19),
characterized in
that the viscosimeter (40) shows flow resistances (15, 15; 27 to 30) such as disk-shaped or leaf-shaped Venturi nozzles or different KV flow resistances with the smallest possible thickness and with a small volume with respect to all other parallel and following capillaries, whereby these flow resistances are placed directly behind the feeding points of the flow division and in the other partial leg behind the flow division there follows a long conduit with a big internal diameter which is furthermore more precisely defined by the fact that the capacity

of this long tube amounts to 100 to 1000 times the KV flow resistance.

5. A viscosimeter according to any of the claims 1 to 4, characterized in
that the direct flow opening of the flow resistance is circular or slit-shaped or has another appropriate geometrical shape. In the case of the microsystem component, this could be a V-shaped or a rectangular channel.

6. A viscosimeter according to any of the claims 1 to 5, characterized in
that the KV flow resistance shows several hole-type openings of 0,1 µ to 150 µ, whereby the size of each opening depends from the total number of openings.

7. A viscosimeter according to any of the claims 1 to 6, characterized in
that in a bridge arrangement (25, 26, 32) in two parallel running flow paths (25, 26) of respectively two or three flow resistances placed in series (27, 28; 29, 30) at least one is configured as KV flow resistance with the smallest possible thickness.

8. A viscosimeter according to any of the claims 1 to 7, characterized in
that a KV flow resistance (30) is placed directly behind a gel permeation chromatography column (GPC column 38), this being seen in flow direction and that a further flow resistance (29) is placed behind the feeding conduit (24) in a leg (26).

9. A viscosimeter according to the claims 1 to 8, characterized in

that at least one big volume retention vessel (23, 34) is placed in the conduit network (14, 22; 24 to 26, 31) or in the legs (L1, L2).

10. A viscosimeter according to any of the claims 1 to 9, characterized in
that a refraction detector (41) and/or a detector working with another working method is placed in the conduit network (24, 31) or in the legs (L1, L2).

11. A viscosimeter according to any of the claims 1 to 10, characterized in
that the conduit network (24 to 26, 31) or the legs (L1, L2) are placed in a thermally constant closed space (39), preferably in a thermally adjustable heat bath.